

IN THE CLAIMS:

Please amend the claims to read as follows:

1.-6. (Cancelled)

7. (Currently Amended) A method for synchronizing a receiver to a transmitter comprising the following steps:

receiving a digital signal from the receiver;

~~demodulating long-syne symbols from the digital signal;~~

correcting for a fractional portion of frequency offset; ~~and~~

~~combining modulation values from two long-syne symbols~~ demodulating at least one synchronization signal from the digital signal to obtain a demodulated synchronization signal; and

correlating different portions of the demodulated synchronization signal to determine an integer portion of the frequency offset.

8. (Currently Amended) A method for synchronizing a receiver to a transmitter comprising the following steps:

receiving a digital signal from the receiver;

~~demodulating long-syne symbols from the digital signal;~~

correcting for a fractional portion of frequency offset; ~~and~~

demodulating at least one synchronization signal from the digital signal to obtain a demodulated synchronization signal;

~~extracting~~ forming from the demodulated synchronization signal vectors of sub-carrier modulation values with progressive trial integer offsets;

dividing each of the vectors by known long synchronization symbol modulation values to obtain trial vectors for a channel transfer function; and

correlating one portion of each of the vectors with an estimate of that portion obtained from the remaining portion of each of the same vectors to determine the vector with the trail frequency offset of maximum correlation thereby identifying the integer frequency offset.

9. (Canceled)

10. (Currently amended) The method of claim ~~[[9]]~~ 8 comprising the additional step of estimating odd frequency values ~~for each of the channel transfer functions~~ from even frequency values for each vector.

11. (Original) The method of claim 10 wherein the step of estimating odd frequency values is performed using an interpolation algorithm.

12. (Currently amended) The method of claim ~~9~~ comprising 11 wherein the correlating step comprises the ~~additional~~ steps of:

correlating the interpolated odd frequency values of the channel transfer function and the actual odd frequency values; and

selecting a correlation value to identify an integer frequency offset number.

13. (Currently amended) The method of claim ~~9~~ comprising the additional 11 wherein the correlating step comprises the steps of:

correlating the interpolated odd frequency values of the channel transfer function and the actual odd frequency values to create a correlation value;

computing a magnitude of the correlation value; and

selecting the largest magnitude of the correlation value to identify an integer frequency offset number.

14. (Original) The method of claim 13 comprising the additional steps of:
associating the largest magnitude of the correlation value with a channel transfer function;

using the channel transfer function to correct data symbols for amplitude and phase shifts.

15. (Currently amended) A method for synchronizing a receiver to a transmitter comprising the following steps:

receiving a digital signal from the receiver;

delaying the digital signal by a sample processing interval to produce a delayed signal;

correlating the digital signal and delayed signal to create a correlator output;

determining a phase shift of the correlator output corresponding to a maximum value of the correlator output wherein the phase shift is an estimate of the fractional portion of carrier frequency offset;

~~extracting long sync symbols from the digital signal;~~

correcting for a the fractional portion of frequency offset;

extracting at least one long sync symbol from the digital signal;

~~extracting~~ forming vectors of modulation values of data sub-carriers with progressive trial integer offsets;

dividing each vector by long sync symbol modulation values to obtain channel transfer functions;

estimating odd frequency values for each of the channel transfer functions;

correlating the interpolated odd frequency values of the channel transfer function and the actual odd frequency values; and

selecting a correlation value to identify an integer frequency offset number.

16.-21 (Cancelled).

22. (New) The method of claim 13 wherein the integer frequency offset number is added to the fractional portion of the frequency offset to determine a total frequency offset

number, further comprising the step of using the total frequency offset number to correct the data symbols for frequency offset.

23. (New) In a communication system using a plurality of carrier frequencies, a method of synchronizing a receiver to a transmitter comprising:

receiving at the receiver a digital signal transmitted from the transmitter,
correcting for a fractional portion of a frequency offset of the carrier frequencies,
demodulating at least one synchronization signal from the digital signal to obtain a demodulated synchronization signal,
forming from the demodulated synchronization signal vectors of sub-carrier modulation values with progressive integer offsets; and
correlating different portions of the vectors of sub-carrier modulation values to determine an integer portion of the frequency offset of the carrier frequencies.

24. (New) The method of claim 7 further comprising the step of combining modulation values from two long sync symbols to obtain the demodulated synchronization signal.